

**AERO CLUB OF WASHINGTON**  
**REMARKS BY ADMINISTRATOR CHARLES BOLDEN**  
March 30, 2015

**AS PREPARED FOR DELIVERY**

**INTRODUCTION**

Thank you, Greg Principato ... It's great to be back here with all of you for this Aero Club Luncheon. I'm joined today by Dr. Jaiwon Shin, my head of Aeronautics, and a number of our NASA colleagues.

As aviation boosters, I think I speak for everyone here in saying that our hearts are heavy today as we extend thoughts and prayers to the victims of the Germanwings tragedy last week. I invite you to join me in a moment of silence for those who lost their lives and for their families.

While the news reports tell us that this was apparently a deliberate act by the co-pilot, anytime a tragedy like this occurs, it reminds us of the importance of protecting the safety of air travelers, especially in skies that are growing more crowded. I know this is a priority of yours and it's one of our highest priorities at NASA as well.

We're joined today by some very special guests – some of whom I had the opportunity to meet at a Flying Classrooms event back in September that was sponsored by the Aero Club Foundation. Can we have some applause for my friends from the Cardozo TransSTEM Academy and the Friendship Tech Prep Academy of Washington D.C.?

The Aero Club really does a wonderful job engaging young folks in Washington – I'm told that you've set the goal of taking every D.C. middle and high school student to the Air & Space Museum. What a great way to capture a young person's imagination.

You know, when I was in school, it never occurred to me that I could someday be a pilot or an astronaut – and certainly not the head of NASA.

So let me thank all of you who are members of the Aero Club for what you're doing to encourage the next generation of Washingtonians to dream big and reach for the skies.

To the students who are with us: I want to thank you too for taking the initiative to come here, and for opening your mind and imagination to the possibility and promise of a career in aerospace. As NASA launches itself into a new era of spaceflight and scientific discovery, there just may be a place for you in America's growing aerospace industry.

So I want to encourage you to work hard, study hard and don't be afraid of failure. I might add that I hope you will consider pursuing education in science, technology, engineering and mathematics, the so-called "STEM" subjects. We need you!

Again, it's great to be back here at the Aero Club. I want to take this opportunity today to update you on some of the exciting things that we're doing at NASA, particularly in the realm of aeronautics.

## **NASA IS WITH YOU WHEN YOU FLY**

Those of you I've already had the pleasure of meeting might have heard me say "NASA is with you when you fly."

Every American aircraft, and every American air traffic control tower is equipped with technology that was developed by NASA.

NASA-developed technologies are saving lives, saving money, and perhaps even saving our planet.

Take for example winglet technology – something about which I know many of you are familiar. It allows planes to fly quieter and cleaner, and NASA's Richard Whitcomb developed it. If you've ever happened to engineer that modern marvel known as a "paper airplane" you know that bending the tips of the wings makes a difference.

Roughly two decades after its development, winglet technology is credited with saving upwards of 4.7 billion – that's billion with a "b" – gallons of jet fuel (according to projections from Aviation Partners and Boeing). At \$1.57 a gallon, that's a savings of more than \$7 billion. At \$2.84 a gallon, where we were last summer, it's a savings of \$13.4 billion and for our planet, it means that less carbon dioxide is being emitted into our atmosphere.

Our commitment at NASA is to continue transforming aviation for the better:

Reducing the environmental impact of flight;

Continuing to pave the way for revolutionary new aircraft shapes and propulsion; and as I mentioned ...

Keeping our skies safe for air travel. We don't want our skies to start getting dangerous as they get more crowded.

Therefore, we're focused on six research and technology thrusts:

The first is safe, efficient growth in global operations. This includes NextGen and technologies to improve safety. We've been working with our industry and government partners, for example, to continue improving and modernizing the nation's air traffic control system so it can safely handle increased air traffic and new types of vehicles. The second is innovation in commercial supersonic aircraft, where we're focused on achieving a quieter sonic boom that could lead to a change in the ruling prohibiting supersonic flight over land.

Third is ultra-efficient commercial vehicles, including pioneering technologies for big leaps in efficiency and lessening environmental impacts.

Fourth is the transition to low-carbon propulsion, including wider acceptance of alternative fuels. This is a big part of the greening of aviation.

Fifth, real-time, system-wide safety assurance, with an emphasis on new integrated monitoring technology.

Last, but certainly not least, number six: identifying and exploring safe, innovative applications of automation and autonomy to aviation, with an emphasis on unmanned aerial system integration and human-machine harmonization.

Now, I'd be remiss if I didn't mention that investments in areas like these are important not only because they advance technological progress and spark innovation – but also because they spur economic activity and create jobs.

Aviation makes our world smaller and our prosperity larger. It generates more than \$1.5 billion in economic activity each year. It supports more than 11.5 million jobs (both directly and indirectly) and as an engine of commerce, it transports 17.7 billion tons of freight year-after-year.

## **SPACE**

Now, Aeronautics puts the first “A” in NASA. I also want to share with you a few thoughts about the “S” – Space.

Through the miracle of modern aviation, I'm speaking to you less than 24 hours after returning home from Russia. I know that some people like to take a day off after a flight like that, but I told my staff that I wouldn't miss visiting the Aero Club for the world!

I was in Russia to attend the launch of American astronaut Scott Kelly and his Russian cosmonaut counterpart, Mikhail Kornienko, into space. It's the first time an American astronaut will live and work in space for an entire year, and it's an important stepping-stone on our journey to Mars.

This launch capped off what's been an exciting few weeks for the space program ... we recently launched a cutting edge science mission; we marked milestones in the Space Launch System – or SLS – rocket; and we welcomed astronauts home from the International Space Station.

## **Mars**

I want to invite you to close your eyes for a moment and imagine a future where human beings and robots work together to pioneer Mars and the Solar System ... at NASA, we're working to turn what once was considered science fiction into fact.

If you are among those of us who saw the State of the Union address back in January, you might recall that the President talked about “...*pushing out into the solar system not just to visit...but to stay.*”

The President has set us on course for a journey to Mars. His vision is for the United States to extend humanity's reach into space while strengthening America's leadership here on earth.

Our goals are to visit an asteroid by 2025 and to put humans in the Martian environment in the 2030's. We'll begin with an unprecedented mission to redirect an asteroid into orbit around the moon. We'll then send astronauts to visit it as part of a stepping stone approach to reach the Red Planet. We just announced details about the robotic capture portion of that initiative last week.

Over the past six years, we've taken the most concrete steps ever to advance a human mission to Mars. Astronauts on the International Space Station, for instance, have been performing groundbreaking experiments to help us learn more about human health in space.

Our latest Mars spacecraft, *MAVEN*, arrived last September to study the Red Planet's upper atmosphere and joined a fleet of orbiters and rovers on the surface. *Maven* is building on America's 40-year legacy of advanced robotic exploration of that planet. America is still the only nation to successfully land a spacecraft on Mars, and this is a legacy we intend to continue. Next year, we will send the *InSight* lander to study the planet's core.

And in 2020 a new rover, building on the incredible success of *Curiosity*, will help us prepare for human arrival at Mars and, for the first time ever, it will cache a sample for later return to Earth.

Recently, we fired up the largest, most powerful booster ever built, in a ground test for the Space Launch System – or SLS - at Orbital ATK Propulsion Systems' test facilities in Utah.

It's another significant milestone among several recently for the rocket that will someday carry astronauts to deep space aboard the *Orion* spacecraft. The SLS has now moved from concept to development, and *Orion* itself also is progressing after its first flight test last year.

We know that technology drives exploration and our journey to Mars. So, we will continue to develop advanced solar electric propulsion systems needed for the Asteroid

Redirect Mission (ARM) and other deep space missions and to make advances in the atomic clocks and green propellants that will guide and power our future missions.

In short, we're firmly on a Journey to Mars and I believe this journey will help guide both our generation and the next.

#### International Space Station

Now, a moment ago I mentioned the International Space Station (ISS). If you look at the ways in which astronauts and scientists from countries across the planet are working together in harmony and common cause, I believe that it's (ISS) truly a blueprint both for international cooperation and for scientific advancement. Together with partners from around the world, we're working off the Earth, for the benefit of the Earth.

Just a few weeks ago, astronauts aboard the Space Station undertook three successful spacewalks. They were helping configure the Station to accept commercial vehicles that are currently being developed by SpaceX and Boeing – in just a couple years, these vehicles will transport American astronauts to the Space Station from American soil.

We've already returned cargo resupply missions to the United States and the result is that we're insourcing jobs and creating a whole new private market in low earth orbit.

This work is an incredible testament to American ingenuity and know-how and an extraordinary validation of the vision we laid out just a few years ago as we prepared for the long planned retirement of the Space Shuttle.

#### NASA Spans the Universe

You've heard me talk a lot about Mars today and before I close I also wanted to tell you about a few other destinations on our journey to discovery – because our exploration spans the universe. Everywhere imaginable, NASA is out there.

After nearly nine years and three billion miles of travel, the *New Horizons* spacecraft was awakened in January to prepare for its arrival in the Pluto system in July.

The *Dawn* spacecraft has just begun to orbit Ceres, the largest asteroid in the main asteroid belt, and became the first mission to orbit what is now considered a dwarf planet. *Juno* is speeding toward arrival at Jupiter next year, where it will not only send back unprecedented data from a first ever polar orbit of our giant neighbor, as the first satellite using solar arrays instead of nuclear power to reach an outer planet, it will demonstrate how solar power can work at great distances from the sun.

Looking to the future, we're planning a mission to explore Jupiter's fascinating moon Europa, selecting instruments this spring and moving toward the next phase of our work.

The Kepler mission continues to discover new planets outside our solar system. It has confirmed more than 1000 planets, some of which could be rocky like Earth. The Solar Dynamics Observatory just took its 100 MILLIONTH image of the sun.

The Hubble Space Telescope marks 25 years in space next month, and is still doing amazing science.

In just three years, we'll launch the James Webb Space Telescope, *Hubble's* successor, which is taking shape right now not far from here in Maryland.

In dozens of other missions, the data streaming back to us is bathing us in information through which scientists will sort, decipher and make discoveries for years to come.

## CONCLUSION

Our journey of discovery is really just only beginning. We're in the midst of a renaissance in many fields and an expansion of many that are still in their infancy – including the discovery of planets outside our solar system.

In a sense, all of this really stands as a tribute to many of the people who have always been part of the Aero Club of Washington. Why do I say that?

Earlier this month, we marked the 100<sup>th</sup> anniversary of the founding of NASA's predecessor, the National Advisory Committee for Aeronautics or N-A-C-A. When N-A-C-A was founded on March 3, 1915, the Aero Club of Washington had already been in existence for six years – pushing then, as you do now, “...to foster and promote interest in the principles and development of aeronautics ...”

For more than a century you've encouraged our neighbors to look upward and dream big.

Amelia Earnhardt is quoted as having said about an early flight ... “*The stars seemed near enough to touch and never before have I seen so many. I always believed the lure of flying is the lure of beauty, but I was sure of it that night ...*”

Today, the future of space exploration, aviation and human discovery are also “near enough to touch” – and that's in no small part because of your work to foster and promote interest in the lure, beauty and potential of aviation. We're embarked on an incredible journey deeper into our solar system and it's a great time to be in the fields of aeronautics and aerospace!

Thanks for inviting me to join you here today and for all that you are doing. I'm happy to take whatever questions you may have.